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HOW CLAY CAN BE TURNED INTO COIN.

WE once (pleasant delusion!) thought ourselves pretty well up in the cunning ways of science; and fancied, in common with many others, that after the electric-telegraph, there was not much more to be invented or discovered. But we have been made aware of our mistake, and in a manner at once surprising and wonderful. Though we were not born to silver slippers, we might have walked about in a pair every year of our life, if we had but known as much as we know now. There the precious metal lay before our eyes, but we would not open them wide enough to see it.

What was there in clay that we did not know? The use which certain writers made of it in pointing their morals was not unfamiliar to us; and one among them had given us reason to believe, that even an imperial Cæsar, when dead, might turn to clay; while others, of a jovial turn of mind, had made themselves merry on the subject of topers moistening their clay. We were not ignorant, therefore, of the morality of clay. Then we knew that alum was got out of clay; that alumina, which is only another name for clay, was the most abundant of earthy bases, constituting no small mass in the structure of the globe;—moreover, that Sir Humphry Davy had knocked down the notion of alumina being an elementary substance, and had demonstrated it to be a metallic oxyd. All this we knew; but we did not know that clay contained so large an amount of argentiferous metal, as to be one of the most valuable substances in nature instead of one of the cheapest, and apparently the most worthless.

That it is so has been satisfactorily proved within the last year by M. Deville, an ingenious Frenchman, who has carried his experiments into the metallic constitution of clay further than ever before. Wöhler, a well-known German chemist, had taken a step beyond Davy, and actually made a lump of clay give up its silver, or aluminum, as the metal was called; but it was only in tiny globules, somewhat resembling seed-pearls in appearance. The result was in no way equal to the cost and labor of the experiment; still, a fact was demonstrated. M. Deville, however, produces the metal in such quantities as to make even grave philosophers hold up their hands in amazement. At a meeting of the Academy of Sciences in Paris, he laid before the learned assemblage long strips of sheet aluminum, ingots of the same metal, and medals of some inches diameter, which had been struck at the Imperial Mint—all of which had been got out of clay by his newly-discovered process.

Such a result must be reckoned among the great facts of science. Let us see how it is accomplished. In Wöhler's process, chloride of potassium was used. The process of M. Deville is somewhat similar, but involves the use of chloride of sodium. The substances having been heated in a porcelain crucible at a high temperature, the aluminum is set free, and to quote the operator's own words, "there remains a saline mass, with an acid reaction, in the midst of which larger or smaller globules of aluminum are found perfectly pure."

Proceeding in his description, which we permit ourselves to relieve of some of its technicalities, M. Deville says: This metal is as white as silver, and malleable and ductile to the highest degree. We find, however, on working it, that it offers a greater resistance, from which we may suppose its tenacity to approach that of iron. Cold hammering hardens it, but its former condition may be restored by remelting. Its melting point differs but slightly from that of silver; it conducts heat well; and may be exposed to the air without any sensible oxydation.

We learn further, that aluminum is perfectly unalterable by dry or damp air; it may be handled and carried in the pocket without becoming tarnished, and it remains brilliant where fresh-cut tin or zinc loses its luster. Neither cold nor boiling water impairs its brightness; even sulphuretted hydrogen, that terrible blackener of plate, finds it altogether insensible; nor does nitric acid, weak or concentrated, act upon it. The only solvent yet known for this apparently indestructible metal is chlorhydric acid, which, by disengaging hydrogen, forms a sesquichloride of aluminum.

Here we let M. Deville speak for himself. "Any one," he says, "will comprehend how a metal, white and unalterable as silver, which does not tarnish, which is fusible, malleable, ductile, and tenacious, and which has the singular property of

being lighter than glass—how highly serviceable such a metal would become were it possible to obtain it easily. If we consider, moreover, that this metal exists naturally in considerable proportions, that its ore is clay, we can but wish for its being brought into use. I have reason to hope that this will be accomplished, for chloride of aluminum is decomposed with remarkable facility at an elevated temperature by common metals; and a reaction of this nature, which I am now trying to realize on a greater scale than a simple laboratory experiment, will resolve the question in a practical point of view."

At M. Deville's last appearance before the Academy, in August, in addition to his specimens of aluminum, he showed one of silicium, which, in its texture and luster, had all the appearance of a metal. Here, then, we have another metal added to the list; and who shall now say where discovery will stop? The silicium, be it understood, is extracted from the aluminum, and exists in it as carbon does in cast-iron. It is supposed to be to ordinary silicium what graphite is to coal.

Now, what are we to think of all this? There being no reason to doubt the facts as we have related them, our first impression is, that we are about to witness a revolution which will affect our commerce, our industry, our science, and our domestic economy. It is already known that some clays contain twenty-five per cent. of aluminum. Who, then, shall set a limit to its production? What a change! The chemist will henceforth have a metal out of which to make his pans, crucibles, and capsules; all indestructible, and all cheap. The platinum pans used in certain manufactures cost five thousand dollars or more. Platinum is exceedingly heavy, aluminum exceedingly light. The latter is, therefore, eminently useful as weights for chemists, who for minute quantities require a weight which shall neither be too small nor liable to rust. How accurate analyses will be when made in unalterable vessels, and tests may be pushed to the very refinement of delicacy! Then in the art culinary. No more tin or copper saucepans; no more brass skillets: all our cooking-utensils will be made of aluminum, from which will ensue a manifest improvement in public health, to say nothing of gratification to our palate. Decidedly, a new era seems to be opening for cooks and confectioners. And where will the "silver-fork" be, when the whole nation is using silver-forks? Will any one ever wish he had been born with silver slippers?

We might fill whole pages with notions as to the changes to be brought about in the industrial and decorative arts. To have architectural ornaments, household articles, tools, and fifty other things, that "won't rust," will be an incalculable benefit; and who knows whether we may not see glittering roofs on our public buildings and temples without having to journey to the East? Then is silver to be superseded as a medium of exchange?—and shall we have a coinage of aluminum? The occupation of counterfeiters will be gone. Then, again, is there no danger of feverish excitement? Shall we not have a whole army of experimentalists setting to work on all sorts of earths? Will clay farms rise in the market? What are we to do for bricks? Will very fat churchyards fetch the highest prices?—and shall we come to bequeath the mortal part of us to our poor relations for the sake of the aluminum it may contain?

Seriously—we believe that most important results will follow M. Deville's discovery; perhaps far beyond what can be predicted at present. It was just as much a problem, perhaps more so, when many of us were boys, to extract soda from seawater; and now it is produced in thousands of tons. So, who shall say what is impossible in turning clay into metal? We all knew that silver "was not anything accounted of in the days of Solomon;" and whether such an argentiferous abundance is again to be realized, remains to be seen.

A Spider's Web.—On stepping out of the house my attention was attracted by a spider's web covering the whole of a large lemon-tree. The web was thrown over it in the most artistic manner, and with the finest effect. Broad cords were stretched out, like the cords of a tent, from its circumference to the neighboring bushes; and it looked as if some genius of the lamp, at the command of its master, had exhausted taste and skill to cover with this delicate drapery the rich-looking fruit beneath. I think the web would have measured full ten yards in diameter.—*Herndon's Valley of the Amazon.*